

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference CL2100PCT	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/US 03/26327	International filing date (<i>day/month/year</i>) 21.08.2003	Priority date (<i>day/month/year</i>) 22.08.2002
International Patent Classification (IPC) or both national classification and IPC B01J23/86		
Applicant E.I. DU PONT DE NEMOURS AND COMPANY et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.
- ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
- These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:
- I ☒ Basis of the opinion
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application

Date of submission of the demand 19.03.2004	Date of completion of this report 07.12.2004
Name and mailing address of the international preliminary examining authority: <div style="display: flex; align-items: center;"> <div> European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016 </div> </div>	Authorized Officer Schoofs, B Telephone No. +31 70 340-7854



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US 03/26327

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-39 as originally filed

Claims, Numbers

1-14 as originally filed

Drawings, Sheets

1/8-8/8 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	
	No: Claims	1-4,11
Inventive step (IS)	Yes: Claims	
	No: Claims	5-10,12-14
Industrial applicability (IA)	Yes: Claims	1-14
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

1. Reference is made to the following documents:

D1: EP-A-0847801
D2: US-A1-2002006374
D3: US-A-3804778
D4: EP-A-0546883
D5: US-A-5185482

2. D1 discloses a bulk catalyst based on chromium and nickel oxides in which the Ni/Cr atomic ratio is between 0.01 and 1 (D1, claims 1 and 6). D2 discloses a nickel-chromium oxide catalyst with the composition $\text{Ni}_{0.01}\text{Cr}_{0.99}\text{O}_x$ (D2, examples 19 and 20). D3 discloses nickel and chromium oxide catalysts with a nickel content between 0.1% and 10% (D3, column 2, lines 10-41 and claims 1 and 3). The subject-matter of claims 1 and 2 is therefore not new (Article 33(2) PCT).
3. The catalysts of D1 and D3 are used as fluorination catalysts in a process for the fluorination of halogenated hydrocarbons or perchloro compounds (D1, examples and claims 8-17; D3, examples and column 3, lines 50-63). The subject-matter of claims 3 and 4 is therefore not new (Article 33(2) PCT).
- 3.1 Dependent claims 5-10 do not appear to contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step. In particular, these claims do not appear to contain any additional technical feature that is associated with any technical effect that could support the presence of an inventive step. Hence, no inventive step is present in the subject-matter of claims 5-10 (Article 33(3) PCT).
4. The catalysts of D1 to D3 are prepared via impregnation (D1, page 2, lines 47-58, examples and claim 1), freeze drying a Cr-Ni mixture (D2, examples 19-20) and thermal decomposition (D3, column 2, lines 17-27) respectively.

- 4.1 The catalyst preparation technique according to the present invention differs from D1-D3 in that the catalyst is prepared via a co-precipitation technique.
- 4.2 However, co-precipitation is a common technique in the art of catalyst preparation (see also paragraph 5 below) and the use of this technique does not appear to be associated with any technical effect in the resulting catalyst, such as an improved catalytic performance. The co-precipitation technique is therefore merely one of several straightforward possibilities from which the skilled person would select, in accordance with circumstances, without the exercise of inventive skill. Hence, no inventive step is present in the subject-matter of claims 11-14 (Article 33(3) PCT).
5. D4 discloses a bulk catalyst based on chromium and nickel oxides in which the Ni/Cr atomic ratio is between 0.05 and 5 (D4, page 3, lines 1-3, claim 1 and examples). The catalyst is used in the fluorination of halogenated hydrocarbons (D4, claims 12-13 and page 4, lines 43-56). The catalyst is prepared via a co-precipitation technique and the addition of ammonia to an aqueous solution is considered to be equivalent to the addition of ammonium hydroxide (D4, page 3, line 4 - page 4, line 18).
- 5.1 In view of preparation example 8 of the present application, it appears that a preparation with 5% nickel results in a nickel incorporation of 2.0 atom%. Hence, it has to be assumed that also a preparation with 5% nickel as disclosed by D4, results in an incorporation of 2% nickel (D4, page 3, lines 1-3). The subject-matter of claims 1-4 and 11 is therefore not new (Article 33(2) PCT), and no inventive step is present in the subject-matter of claims 5-10 and 12-14 (Article 33(3) PCT).
6. D5 discloses catalysts based on chromium and cobalt oxides and their use in a fluorination process (D5, examples and claims 1 and 7). Hence, it appears that any limitation of the claims to further introduce the presence of cobalt would lack an inventive step.
- 6.1 Regarding the crystallinity of the catalyst, it is observed that according to the examples of the present application, calcination at 400°C results in the formation of a crystalline alpha-chromium oxide phase (see preparation examples 1, 7 and 8). Hence, such a calcination step at 400°C will also result in the formation of a crystalline alpha-chromium oxide phase in the preparation of the prior art catalysts

according to D1-D5. In this connection, reference is made to D4, page 5, lines 16-20.

Additional comment:

7. Upon entry into the European phase, the term "about" as used in claims 1 and 11 has to be deleted.
- 7.1 Claims 1, 2 and 3 have been drafted as separate independent claims and should be replaced by a single independent claim.
- 7.2 The expression "incorporated herein by reference" or similar expression used anywhere throughout the description have to be deleted (see page 23, lines 3-6 and page 28, lines 13-14).
- 7.3 On page 13, line 35 and page 23, line 4, or anywhere throughout the description, references to the prior art should be indicated by a publication number instead of an application number. These documents will be taken into consideration upon entry into the European phase.